

From the INTERNATIONAL BUREAU

**PCT**

**NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing:

13 July 2000 (13.07.00)

International application No.:

PCT/EP99/10395

Applicant's or agent's file reference:

A-21950/A

International filing date:

27 December 1999 (27.12.99)

Priority date:

31 December 1998 (31.12.98)

Applicant:

AUSCHRA, Clemens et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International preliminary Examining Authority on:

11 May 2000 (11.05.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

# TENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>A-21950/A</b>	<b>FOR FURTHER ACTION</b> <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. <b>PCT/EP 99/ 10395</b>	International filing date (day/month/year) <b>27/12/1999</b>	(Earliest) Priority Date (day/month/year) <b>31/12/1998</b>
Applicant  <b>CIBA SPECIALTY CHEMICALS HOLDING INC et al</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.  
☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

EP 99/10395

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F293/00 C08L53/00 C09D153/00 C08F2/38 C08F4/40  
C09D11/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F C07C C09D C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 99 03938 A (DU PONT) 28 January 1999 (1999-01-28) * examples ; page 4, line 4 - page 6, line 10 ; page 7, line 6-8 ; page 7, line 26-30 * page 2, line 1-17; claims 1-9	1,3-14, 16,17
P,X	EP 0 962 473 A (DSM NV) 8 December 1999 (1999-12-08) * page 2, line 24-37 ; page 2, line 47-51 ; page 3, line 24 - page 4, line 19 ; page 4, line 58 - page 5, line 1 * page 4, line 56,57 — -/-	1-13,15

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search

3 March 2000

Date of mailing of the international search report

13/03/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Hammond, A

## INTERNATIONAL SEARCH REPORT

International Application No.

EP 99/10395

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 218 436 A (DU PONT) 15 April 1987 (1987-04-15) cited in the application	1,3-10, 13,14, 16,17
Y	* claims 10, 1-11 ; page 4, line 39 - page 6, line 24 ; page 3, line 55 - page 4, line 32 ; page 10, line 16, 25 ; examples *	2
X	EP 0 329 873 A (DU PONT) 30 August 1989 (1989-08-30)	1,3-9, 13,14, 16,17
Y	* example 5 ; page 3, line 50-51 ; claims 12, 11 ; page 4, line 13-22 ; examples 1-7 ; page 2, line 45 - page 4, line 30 ; abstract ; page 3, line 50 *	2,10
X	EP 0 518 225 A (DU PONT) 16 December 1992 (1992-12-16)	1,3-7, 9-14,16, 17
	* page 4, line 13-54 ; page 7, line 57 ; page 8, line 20 - page 13, line 55 ; preparations 1-6 ; claim 5, 9-30 ; page 14, line 27-33 *	
X	US 4 925 765 A (MADELEINE DENNIS G) 15 May 1990 (1990-05-15)	1,3-8, 10,13, 14,16,17
	* example 1 ; claims 7, 8 * column 3, line 59-68	
X	EP 0 323 181 A (DU PONT) 5 July 1989 (1989-07-05)	1,3,4
	* page 2, line 19-32 ; page 2, line 48-55 ; page 4, line 4-10 ; page 4, line 28-42 * claims 1,9	
Y	US 5 789 487 A (MATYJASZEWSKI KRZYSZTOF ET AL) 4 August 1998 (1998-08-04) cited in the application column 9, line 8 -column 10, line 34	2
Y	US 5 807 937 A (MATYJASZEWSKI KRZYSZTOF ET AL) 15 September 1998 (1998-09-15) * claim 6 ; column 6, line 49 * column 16, line 46 -column 18, line 28	2
P,Y	WO 99 62961 A (CIBA SC HOLDING AG ;ASAKURA TOSHIKAGE (JP); OHWA MASAKI (JP); TATS) 9 December 1999 (1999-12-09) * page 17, line 18 - page 19, line 12 ; claims 12-19 ; page 29, line 26-33 ; page 31, line 13 - page 35, line 13 *	10

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

EP 99/10395

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9903938	A	28-01-1999	US	5859113 A	12-01-1999
			AU	8494398 A	10-02-1999
EP 0962473	A	08-12-1999	WO	9962978 A	09-12-1999
EP 0218436	A	15-04-1987	US	4656226 A	07-04-1987
			AT	69057 T	15-11-1991
			AU	584848 B	01-06-1989
			AU	6325986 A	02-04-1987
			BR	8604644 A	09-06-1987
			CA	1247272 A	20-12-1988
			DE	3682251 A	05-12-1991
			DK	463086 A	31-03-1987
			ES	2002014 A	01-07-1988
			HK	28192 A	24-04-1992
			JP	1958714 C	10-08-1995
			JP	6092473 B	16-11-1994
			JP	62081459 A	14-04-1987
			KR	9508518 B	31-07-1995
			MX	164882 B	29-09-1992
			NO	863873 A, B,	31-03-1987
			SG	101791 G	17-01-1992
			ZA	8607454 A	25-05-1988
EP 0329873	A	30-08-1989	AT	81139 T	15-10-1992
			US	4755563 A	05-07-1988
EP 0518225	A	16-12-1992	US	5221334 A	22-06-1993
			DE	69207651 D	29-02-1996
			DE	69207651 T	09-05-1996
			JP	2635266 B	30-07-1997
			JP	5179183 A	20-07-1993
			US	5272201 A	21-12-1993
US 4925765	A	15-05-1990	AU	663464 B	12-10-1995
			AU	4752990 A	01-08-1990
			CA	2006215 A	23-06-1990
			CN	1043801 A	11-07-1990
			DE	68924430 D	02-11-1995
			EP	0457764 A	27-11-1991
			WO	9007732 A	12-07-1990
EP 0323181	A	05-07-1989	US	4812517 A	14-03-1989
			CA	1304852 A	07-07-1992
			JP	1204914 A	17-08-1989
US 5789487	A	04-08-1998	AU	3585997 A	02-02-1998
			BR	9710273 A	10-08-1999
			CA	2259995 A	15-01-1998
			CN	1228789 A	15-09-1999
			EP	0914352 A	12-05-1999
			WO	9801480 A	15-01-1998
			US	5945491 A	31-08-1999
US 5807937	A	15-09-1998	AU	1073997 A	05-06-1997
			BR	9611512 A	29-06-1999
			CA	2237055 A	22-05-1997
			EP	0861272 A	02-09-1998

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

EP 99/10395

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5807937 A		W0 9718247 A	22-05-1997
W0 9962961 A	09-12-1999	NONE	

# PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

PCT

## NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:	
CIBA SPECIALTY CHEMICALS HOLDING INC.	
Patentabteilung	
Klybeckstrasse	Essort P/TM/SI LE 5
CH-4057 Basel	
SUISSE	
24. Juli 2000	
PATA	PATH SES

Date of mailing (day/month/year) 13 July 2000 (13.07.00)		IMPORTANT NOTICE	
Applicant's or agent's file reference A-21950/A			
International application No. PCT/EP99/10395 ✓	International filing date (day/month/year) 27 December 1999 (27.12.99) ✓	Priority date (day/month/year) 31 December 1998 (31.12.98) ✓	
Applicant CIBA SPECIALTY CHEMICALS HOLDING INC. et al (EP/p1)			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
AU,CN,JP,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:  
AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,GE, GH,GM,HR,HU,ID,IL,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,NO,NZ, OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW  
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 13 July 2000 (13.07.00) under No. WO 00/40630

### REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

### REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

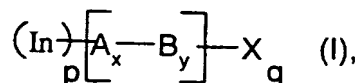
For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

### Claims

#### 1. A composition comprising

a) 0.1 - 99.9 % by weight of a block copolymer of the formula:



wherein:

In represents a polymerization initiator fragment of a polymerization initiator capable of initiating atomic transfer radical polymerization (ATRP) of ethylenically unsaturated monomers in the presence of a catalyst capable of activating controlled radical polymerization;

p represents a numeral greater than zero and defines the number of initiator fragments;

A and B represent polymer blocks which differ in polarity and consist of repeating units of ethylenically unsaturated monomers;

x and y represent numerals greater than zero and define the number of monomer repeating units in polymer blocks A and B;

X represents a polymer chain terminal group; and

q represents a numeral greater than zero; and

b) 0.1 - 99.9 % by weight of dispersible inorganic or organic pigment particles.

#### 2. A composition according to claim 1, wherein

In represents the polymerization initiator fragment of a polymerization initiator which is selected from the group consisting of C<sub>1</sub>-C<sub>8</sub>-alkyl halides, C<sub>6</sub>-C<sub>15</sub>-aralkylhalides, C<sub>2</sub>-C<sub>8</sub>-haloalkyl esters, arene sulfonyl chlorides, haloalkanenitriles, α-haloacrylates and halolactones; and

p represents one.

#### 3. A composition according to claim 1, wherein the difference in polarity is obtained by co-polymerizing polymer blocks A and B with different amounts of functional monomers.

#### 4. A composition according to claim 3, wherein the content of functional monomers in each polymer block A or B differs from the other polymer block by at least 20 % by weight.



5. A composition according to claim 4, wherein the content of functional monomers in polymer block B is at least 20 % by weight higher as compared to polymer block A.
6. A composition according to claim 1, wherein A and B represent polymer blocks containing repeating units of polymerizable monomers selected from the group consisting of styrenes, acrolein and acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-C<sub>1</sub>-C<sub>24</sub>-alkyl esters.
7. A composition according to claim 1, wherein the polymer blocks B is more hydrophilic as compared to polymer block A and consists of higher amounts of monomers carrying functional groups and wherein the monomers are selected from the group consisting of acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid or anhydrides and salts thereof, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-mono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamino-C<sub>2</sub>-C<sub>4</sub>-alkyl esters and salts thereof, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>3</sub>silyloxy-C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>3</sub>silyl-C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-heterocyclyl-C<sub>2</sub>-C<sub>4</sub>-alkyl esters and salts thereof, C<sub>1</sub>-C<sub>24</sub>-alkoxylated poly-C<sub>2</sub>-C<sub>4</sub>-alkylene glycol acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylamides, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylmono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamides, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacryl-di-C<sub>1</sub>-C<sub>4</sub>-alkylamino-C<sub>2</sub>-C<sub>4</sub>-alkylamides and salts thereof, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacryl-amino-C<sub>2</sub>-C<sub>4</sub>-alkylamides, acrylonitrile, methacrylonitrile, 4-aminostyrene and salts thereof, di-C<sub>1</sub>-C<sub>4</sub>-alkylaminostyrene and salts thereof, vinyl substituted heterocycles, styrene sulfonic acid and salts, vinylbenzoic acid and salts, vinylformamide and amidosulfonic acid derivatives.
8. A composition according to claim 1 wherein the polymer blocks A or B or both are reaction products with reactive polar monomers selected from the group consisting of glycidyl acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid esters, 2-isocyanatoethyl acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid esters and C<sub>3</sub>-C<sub>8</sub>-alkyl- or C<sub>3</sub>-C<sub>8</sub>-alkenyl-dicarboxylic acid anhydrides.
9. A composition according to claim 1 wherein the dispersible organic pigment particles of component b) are selected from the azo pigment group consisting of azo, disazo, naphthol, benzimidazolone, azocondensation, metal complex, isoindolinone, and isoindoline pigments, the chinophthalon pigment, dioxazine pigment and the polycyclic pigment group consisting of indigo, thioindigo, quinacridones, phthalocyanines, perylenes, perionones, anthraquinones, such as aminoanthraquinones or hydroxyanthraquinones, anthrapyrimidines, indanthrones, flavanthrones, pyranthrones, anthantrones, isoviolanthrones, diketopyrrolopyrrole, and carbazoles, pigments and pearlescent flakes.

10. A composition according to claim 1 wherein the dispersible inorganic pigment particles of component b) are selected from the group consisting of aluminum, aluminum oxide, silicon oxide and silicates, iron(III)oxide, chromium(III)oxide, titanium(IV)oxide, zirconium(IV)oxide, zinc oxide, zinc sulfide, zinc phosphate, mixed metal oxide phosphates, molybdenum sulfide, cadmiumsulfide, carbon black or graphite, vanadates, chromates, and molybdates, and mixtures, crystal forms or modifications thereof.
11. A composition according to claim 1 which additionally contains binding agents and conventional additives.
12. A composition according to claim 11 wherein the conventional additives are selected from the group consisting of surfactants, stabilizers, anti-foaming agents, dyes, plasticizers, thixotropic agents, drying catalysts, anti-skinning agents and leveling agents.
13. A composition according to claim 1 comprising
  - a) 0.1 - 99.9% by weight of a block copolymer (I), wherein In, X, p and q are as defined in claim 1;

A represents a polymer block consisting of repeating units of acrylic or methacrylic acid-C<sub>1</sub>-C<sub>24</sub>-alkyl esters;

B represents a polymer block consisting of repeating units of acrylic or methacrylic acid-C<sub>1</sub>-C<sub>24</sub>-alkyl esters which are copolymerized with at least 50 % by weight of monomers carrying functional groups and wherein the monomers are selected from the group consisting of acrylic or methacrylic acid and salts thereof, acrylic or methacrylic acid-mono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamino-C<sub>2</sub>-C<sub>4</sub>-alkyl esters and salts thereof, acrylic or methacrylic acid-hydroxy -C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or methacrylamide, acrylic or methacrylic-mono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamides, acrylic or methacryl-amino-C<sub>2</sub>-C<sub>4</sub>alkylamides, and vinyl substituted heterocycles selected from the group consisting of vinylpyrrolidone, vinylimidazole or salts thereof and vinylcarbazole;

x and y represent numerals greater than zero and define the number of monomer repeating units in A and B; and

X represents a polymer chain terminal group; and
  - b) 0.1 - 99.9 % by weight of dispersible pigment particles.
14. A pigment dispersion comprising a dispersed phase consisting of

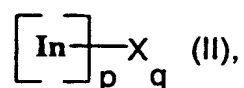
-37-

a) a block copolymer of the formula I, wherein In, A, B, X, x, y, p and q are as defined in claim 1; and

b) dispersed pigment particles;

and a liquid carrier selected from the group consisting of water, organic solvents and mixtures thereof.

15. A process for preparing a composition according to claim 1, which comprises copolymerizing by atom transfer radical polymerization (ATRP) fragments A and B in the presence of polymerization initiator



wherein In, p and q are as defined in claim 1, and X represents Halogen and a catalytically effective amount of a catalyst capable of activating controlled atomic radical polymerization, replacing halogen X with a different polymer chain terminal group X' and adding dispersible pigment particles and optionally binder materials, fillers or other conventional additives.

16. A process for preparing a pigment dispersion according to claim 14 which comprises dispersing in a liquid carrier pigment particles in the presence of a block copolymer of the formula I, wherein I, A, B, X, x, y, p and q are as defined in claim 1.
17. Use of the pigment dispersion according to claim 14 for preparing coating compositions, prints, images, inks or lacquers.

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>A-21950/A</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/EP99/10395</b>	International filing date (day/month/year) <b>27/12/1999</b>	Priority date (day/month/year) <b>31/12/1998</b>
International Patent Classification (IPC) or national classification and IPC <b>C08F293/00</b>		
Applicant <b>CIBA SPECIALTY CHEMICALS HOLDING INC. et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand  <b>11/05/2000</b>	Date of completion of this report  <b>30. 11. 00</b>
Name and mailing address of the international preliminary examining authority:   <b>European Patent Office</b> <b>D-80298 Munich</b> <b>Tel. +49 89 2399 - 0 Tx: 523656 epmu d</b> <b>Fax: +49 89 2399 - 4465</b>	Authorized officer  <b>Sieber, W</b>  Telephone No. <b>+49 89 2399 8519</b>  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP99/10395

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

**Description, pages:**

1-33 as originally filed

**Claims, No.:**

1-16 as received on 14/11/2000 with letter of 09/11/2000

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/10395

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-16
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations  
see separate sheet

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
see separate sheet

## VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
see separate sheet

***Re Item I***

Claim 1 has been amended by specifying the polymerization initiator and by indicating that the index p should be one or two.

Claim 2 as originally filed is the basis for the specified polymerization initiators in combination with p=1. There is, however, no basis in the application as filed for the specified polymerization initiators in combination with p=2. On page 5, lines 9-10 it is stated that "the polymerization initiator may also be bifunctional. In this case p and q may be two." Said statement is not a proper basis for amended claim 1 where p=2. Firstly, p and q are not independent in said passage. Said passage specifically refers to bifunctional polymerization initiators where p and q are 2. Secondly, said passage does not refer to the now specified group of initiators as being bifunctional. Thus, the part of claim 1 where p=2 is not supported by the application as filed (Art.34(2)(b) PCT).

***Re Item V***

1. The present comments are made for said part of the claims where p=1. In this context, reference is made to the following documents:

D1 EP-A-0 218 436 ✓  
D2 EP-A-0 329 873 ✓  
D3 EP-A-0 518 225 ✓  
D4 US-A-4 925 765  
D5 EP-A-0 323 181 ✓  
D6 US-A-5 807 937. ✓

2. Pigment compositions containing block copolymers originating from group transfer radical polymerization are known from D1-D5. The present application differs from said documents by the use of different initiators. Thus, the subject-matter of claims 1-16 is novel (Art.33(2) PCT).
3. The application as filed does not show any unexpected effect over the pigmented compositions of the prior art due to the use of a different catalyst. Thus, the objective problem of the present application can only be seen in providing alternative polymers. Nothing inventive can, however, be seen in the use of the specified initiators as said initiators are known initiators in group transfer radical

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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polymerization or atomic transfer radical polymerization (see D6). Thus, the subject-matter of claims 1-16 is not based on an inventive step (Art.33(3) PCT).

***Re Item VII***

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1-D6 is not mentioned in the description, nor are these documents identified therein.

***Re Item VIII***

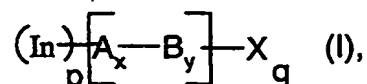
The description is not in line with the amended claims.



Claims

## 1. A composition comprising

a) 0.1 - 99.9 % by weight of a block copolymer of the formula:



wherein:

In represents a polymerization initiator fragment of a polymerization initiator which is selected from the group consisting of C<sub>1</sub>-C<sub>8</sub>-alkyl halides, C<sub>6</sub>-C<sub>15</sub>-aralkylhalides, C<sub>2</sub>-C<sub>8</sub>-haloalkyl esters, arene sulfonyl chlorides, haloalkanenitriles, α-haloacrylates and halolactones;

p represents one or two;

A and B represent polymer blocks which differ in polarity and consist of repeating units of ethylenically unsaturated monomers;

x and y represent numerals greater than zero and define the number of monomer repeating units in polymer blocks A and B;

X represents a polymer chain terminal group; and

q represents a numeral greater than zero; and

b) 0.1 - 99.9 % by weight of dispersible inorganic or organic pigment particles.

2. A composition according to claim 1, wherein the difference in polarity is obtained by copolymerizing polymer blocks A and B with different amounts of functional monomers.
3. A composition according to claim 2, wherein the content of functional monomers in each polymer block A or B differs from the other polymer block by at least 20 % by weight.
4. A composition according to claim 3, wherein the content of functional monomers in polymer block B is at least 20 % by weight higher as compared to polymer block A.
5. A composition according to claim 1, wherein A and B represent polymer blocks containing repeating units of polymerizable monomers selected from the group consisting of styrenes, acrolein and acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-C<sub>1</sub>-C<sub>24</sub>-alkyl esters.
6. A composition according to claim 1, wherein the polymer blocks B is more hydrophilic as compared to polymer block A and consists of higher amounts of monomers carrying func-

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tional groups and wherein the monomers are selected from the group consisting of acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid or anhydrides and salts thereof, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-mono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamino-C<sub>2</sub>-C<sub>4</sub>-alkyl esters and salts thereof, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>3</sub>silyloxy-C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>3</sub>silyl-C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid-heterocyclyl-C<sub>2</sub>-C<sub>4</sub>-alkyl esters and salts thereof, C<sub>1</sub>-C<sub>24</sub>-alkoxylated poly-C<sub>2</sub>-C<sub>4</sub>-alkylene glycol acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid esters, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylamides, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylmono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamides, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacryl-di-C<sub>1</sub>-C<sub>4</sub>-alkylamino-C<sub>2</sub>-C<sub>4</sub>-alkylamides and salts thereof, acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacryl-amino-C<sub>2</sub>-C<sub>4</sub>-alkylamides, acrylonitrile, methacrylonitrile, 4-aminostyrene and salts thereof, di-C<sub>1</sub>-C<sub>4</sub>-alkylaminostyrene and salts thereof, vinyl substituted heterocycles, styrene sulfonic acid and salts, vinylbenzoic acid and salts, vinylformamide and amidosulfonic acid derivatives.

7. A composition according to claim 1 wherein the polymer blocks A or B or both are reaction products with reactive polar monomers selected from the group consisting of glycidyl acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid esters, 2-isocyanatoethyl acrylic or C<sub>1</sub>-C<sub>4</sub>-alkylacrylic acid esters and C<sub>3</sub>-C<sub>8</sub>-alkyl- or C<sub>3</sub>-C<sub>8</sub>-alkenyl-dicarboxylic acid anhydrides.
8. A composition according to claim 1 wherein the dispersible organic pigment particles of component b) are selected from the azo pigment group consisting of azo, disazo, naphthol, benzimidazolone, azocondensation, metal complex, isoindolinone, and isoindoline pigments, the chinophthalon pigment, dioxazine pigment and the polycyclic pigment group consisting of indigo, thioindigo, quinacridones, phthalocyanines, perylenes, perionones, anthraquinones, such as aminoanthraquinones or hydroxyanthraquinones, anthrapyrimidines, indanthrones, flavanthrones, pyranthrones, anthantrones, isoviolanthrones, diketopyrrolopyrrole, and carbazoles, pigments and pearlescent flakes.
9. A composition according to claim 1 wherein the dispersible inorganic pigment particles of component b) are selected from the group consisting of aluminum, aluminum oxide, silicon oxide and silicates, iron(III)oxide, chromium(III)oxide, titanium(IV)oxide, zirconium(IV)oxide, zinc oxide, zinc sulfide, zinc phosphate, mixed metal oxide phosphates, molybdenum sulfide, cadmiumsulfide, carbon black or graphite, vanadates, chromates, and molybdates, and mixtures, crystal forms or modifications thereof.
10. A composition according to claim 1 which additionally contains binding agents and conventional additives.

11. A composition according to claim 10 wherein the conventional additives are selected from the group consisting of surfactants, stabilizers, anti-foaming agents, dyes, plasticizers, thixotropic agents, drying catalysts, anti-skinning agents and leveling agents.

12. A composition according to claim 1 comprising

- a) 0.1 - 99.9% by weight of a block copolymer (I), wherein In, X, p and q are as defined in claim 1;

A represents a polymer block consisting of repeating units of acrylic or methacrylic acid-C<sub>1</sub>-C<sub>24</sub>-alkyl esters;

B represents a polymer block consisting of repeating units of acrylic or methacrylic acid-C<sub>1</sub>-C<sub>24</sub>-alkyl esters which are copolymerized with at least 50 % by weight of monomers carrying functional groups and wherein the monomers are selected from the group consisting of acrylic or methacrylic acid and salts thereof, acrylic or methacrylic acid-mono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamino-C<sub>2</sub>-C<sub>4</sub>-alkyl esters and salts thereof, acrylic or methacrylic acid-hydroxy -C<sub>2</sub>-C<sub>4</sub>-alkyl esters, acrylic or methacrylamide, acrylic or methacrylic-mono- or -di-C<sub>1</sub>-C<sub>4</sub>-alkylamides, acrylic or methacryl-amino-C<sub>2</sub>-C<sub>4</sub>alkylamides, and vinyl substituted heterocycles selected from the group consisting of vinylpyrrolidone, vinylimidazole or salts thereof and vinylcarbazole;

x and y represent numerals greater than zero and define the number of monomer repeating units in A and B; and

X represents a polymer chain terminal group; and

- b) 0.1 - 99.9 % by weight of dispersible pigment particles.

13. A pigment dispersion comprising a dispersed phase consisting of

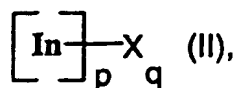
- a) a block copolymer of the formula I, wherein In, A, B, X, x, y, p and q are as defined in claim 1; and

- b) dispersed pigment particles;

and a liquid carrier selected from the group consisting of water, organic solvents and mixtures thereof.

14. A process for preparing a composition according to claim 1, which comprises copolymerizing by atom transfer radical polymerization (ATRP) fragments A and B in the presence of polymerization initiator

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wherein In, p and q are as defined in claim 1, and X represents Halogen and a catalytically effective amount of a catalyst capable of activating controlled atomic radical polymerization, replacing halogen X with a different polymer chain terminal group X' and adding dispersible pigment particles and optionally binder materials, fillers or other conventional additives.

15. A process for preparing a pigment dispersion according to claim 13 which comprises dispersing in a liquid carrier pigment particles in the presence of a block copolymer of the formula I, wherein I, A, B, X, x, y, p and q are as defined in claim 1.
16. Use of the pigment dispersion according to claim 14 for preparing coating compositions, prints, images, inks or lacquers.



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b> C08F 293/00, C08L 53/00, C09D 153/00, C08F 2/38, 4/40, C09D 11/00	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 00/40630</b>  <b>(43) International Publication Date:</b> 13 July 2000 (13.07.00)
<b>(21) International Application Number:</b> PCT/EP99/10395 <b>(22) International Filing Date:</b> 27 December 1999 (27.12.99)  <b>(30) Priority Data:</b> 98124860.2                      31 December 1998 (31.12.98)      EP  <b>(71) Applicant (for all designated States except US):</b> CIBA SPECIALTY CHEMICALS HOLDING INC. [CH/CH]; Klybeckstrasse 141, CH-4057 Basel (CH).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> AUSCHRA, Clemens [DE/DE]; Rennweg 7, D-79106 Freiburg (DE). MÜHLEBACH, Andreas [CH/CH]; Kirchmattweg 31, CH-5070 Frick (CH). ECKSTEIN, Ernst [DE/DE]; Hintern Holz 18, D-79618 Rheinfelden (DE).  <b>(74) Common Representative:</b> CIBA SPECIALTY CHEMICALS HOLDING INC.; Patentabteilung, Klybeckstrasse 141, CH-4057 Basel (CH).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> PIGMENT COMPOSITION CONTAINING ATRP POLYMERS		
<b>(57) Abstract</b>		
<p>The present invention relates to a composition containing ATRP polymers and dispersible inorganic or organic pigment particles. The pigment composition is useful for preparing coating compositions, prints, images, inks or lacquers and other disperse systems.</p>		

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/10395

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F293/00 C08L53/00 C09D153/00 C08F2/38 C08F4/40  
C09D11/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F C07C C09D C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 99 03938 A (DU PONT) 28 January 1999 (1999-01-28) * examples ; page 4, line 4 - page 6, line 10 ; page 7, line 6-8 ; page 7, line 26-30 * page 2, line 1-17; claims 1-9	1,3-14, 16,17
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-/-

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

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Date of the actual completion of the international search

3 March 2000

Date of mailing of the international search report

13/03/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Hammond, A

## INTERNATIONAL SEARCH REPORT

Int. Application No.

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	* example 5 ; page 3, line 50-51 ; claims 12, 11 ; page 4, line 13-22 ; examples 1-7 ; page 2, line 45 - page 4, line 30 ; abstract ; page 3, line 50 *	2,10
X	EP 0 518 225 A (DU PONT) 16 December 1992 (1992-12-16)  * page 4, line 13-54 ; page 7, line 57 ; page 8, line 20 - page 13, line 55 ; preparations 1-6 ; claim 5, 9-30 ; page 14, line 27-33 *	1,3-7, 9-14,16, 17
X	US 4 925 765 A (MADELEINE DENNIS G) 15 May 1990 (1990-05-15)  * example 1 ; claims 7, 8 * column 3, line 59-68	1,3-8, 10,13, 14,16,17
X	EP 0 323 181 A (DU PONT) 5 July 1989 (1989-07-05) * page 2, line 19-32 ; page 2, line 48-55 ; page 4, line 4-10 ; page 4, line 28-42 * claims 1,9	1,3,4
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Information on patent family members

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information on patent family members

Int'l Application No

PCT/EP 99/10395

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